AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listing, of claims in the application:

Listing of Claims:

1. (Currently Amended) An irradiation cell for producing a radioisotope of interest through the irradiation of a target material by a particle beam, the irradiation cell comprising a target body, a diffuser configured to provide a path for a cooling medium, and a removable metallic insert comprising a cavity designed to house the target material and the cavity closed by an irradiation window, the metallic insert configured to be inserted in and removed from the target body, wherein the removable metallic insert comprises at least two separate metallic parts of different materials, the metallic insert comprising at least a first part and a second part, the first part having an elongated cavity that is longer in a direction parallel to the particle beam that irradiates the target than in a direction perpendicular to the particle beam, and the second part partially surrounding the first part and forming a channel configured to guide a cooling medium.

2. (Cancelled)

3. (Previously Presented) The irradiation cell according to claim 1, wherein said cell further comprises a coolant supply configured to supply the cooling medium and the coolant supply in connection with the channel the diffuser device surrounding the first part and being configured to guide the cooling medium around the first part, and wherein the second part surrounds both the first part and the diffuser device in a manner to form a return path for the cooling medium between the diffuser device and the second part.

4. (Previously Presented) The irradiation cell according to claim 1, wherein the contact between the first and second part is a metal-to-metal contact, and wherein the parts are sealed by at least one O-ring.

5. (Previously Presented) The irradiation cell according to claim 1, wherein the first and second parts are sealed by a gold foil between the parts.

6. (Cancelled)

7. (Previously Presented) The irradiation cell according to claim 1, wherein the first and second parts are assembled together by a number of bolts.

8. (Previously Presented) The irradiation cell according to claim 1, wherein the first and second parts are assembled together by welding.

9. (Previously Presented) The irradiation cell according to claim 1, wherein the first part comprises a flat, circular and ring-shaped portion having an inner circular edge and an outer circular edge, a cylindrical portion rising perpendicularly from the inner circular edge of the flat portion, and a hemispherical portion being on top of the cylindrical portion, the cavity being formed inside the cylindrical and hemispherical portions.

10. (Previously Presented) The irradiation cell according to claim 9, wherein the cylindrical portion and/or the hemispherical portion have a wall thickness comprised between 0.3 and 0.7 mm and/or the cavity has a length of at least 50 mm.

11. (Previously Presented) The irradiation cell according to claim 9, wherein the second part has the form of a hollow cylinder having two flat sides essentially perpendicular to a cylindrical side, the cylinder being connected by one flat side against the flat portion of the first part.

12. (Previously Presented) The irradiation cell according to claim 9, wherein one of the two parts has a ridge and the other has a groove corresponding to the ridge, in order to obtain perfect coaxial positioning of the two parts with respect to each other.

13. (Previously Presented) The irradiation cell according to claim 1, wherein the first part is made of niobium or tantalum.

14. (Previously Presented) The irradiation cell according to claim 1 , wherein the second part is made of stainless steel.

15–16. (Cancelled)

17. (Previously Presented) A method for filling the cavity volume of the irradiation cell according to claim 1 with about 50% of target material before starting irradiation.

18–19. (Cancelled)

20. (Previously Presented) The irradiation cell according to claim 1, wherein the cell further comprises a supply tube for a cooling medium and, in connection with the supply tube, a diffuser device mounted on one end of the supply tube, the diffuser

device surrounding the first part, the diffuser element being configured to guide the cooling medium around the first part, and wherein the second part surrounds both the first part and the diffuser element in a manner to form a return path for the cooling medium between the diffuser element and the second part.

21. (Currently Amended) An irradiation cell for producing a radioisotope of interest through the irradiation of a target material by a particle beam, the irradiation cell comprising a target body, a diffuser for providing a path for a cooling medium, and a removable metallic insert comprising a cavity designed to house the target material, the cavity closed by an irradiation window, the metallic insert configured to be inserted in and removed from the target body, wherein the removable metallic insert comprises at least two separate metallic parts of different materials, the metallic insert comprising at least a first part and a second part, the first part having a cylindrical portion and a hemispherical portion and machined from ~~comprising~~ a material selected from the group consisting of niobium and tantalum and forming a cavity that is elongate in a direction parallel to the particle beam that irradiates the target, and the second part being a generally cylindrical hollow member disposed concentrically about the first part and comprising a material selected from the group consisting of stainless steel, silver, and titanium, with the second part disposed around at least a portion of the elongate cavity of the first part and the first and second parts forming a channel configured to guide a cooling medium.

22. (Previously Presented) The irradiation cell according to claim 21, wherein said cell further comprises a coolant supply configured to supply the cooling medium and the coolant supply in connection with the channel the diffuser device surrounding the first part and being configured to guide the cooling medium around the first part, and wherein the second part surrounds both the first part and the diffuser device in a

manner to form a return path for the cooling medium between the diffuser device and the second part.

23. (Previously Presented) The irradiation cell according to claim 21, wherein the contact between the first and second part is a metal-to-metal contact, and wherein the parts are sealed by at least one O-ring.

24. (Previously Presented) The irradiation cell according to claim 21, wherein the first and second parts are sealed by a gold foil between the parts.

25. (Previously Presented) The irradiation cell according to claim 21, wherein the first and second parts are assembled together by a number of bolts.

26. (Previously Presented) The irradiation cell according to claim 21, wherein the first and second parts are assembled together by welding.

27. (Previously Presented) The irradiation cell according to claim 21, wherein the first part comprises a flat, circular and ring-shaped portion having an inner circular edge and an outer circular edge, a cylindrical portion rising perpendicularly from the inner circular edge of the flat portion, and a hemispherical portion being on top of the cylindrical portion, the cavity being formed inside the cylindrical and hemispherical portions.

28. (Previously Presented) The irradiation cell according to claim 27, wherein the cylindrical portion and/or the hemispherical portion have a wall thickness comprised between 0.3 and 0.7 mm.

29. (Previously Presented) The irradiation cell according to claim 27, wherein the second part has the form of a hollow cylinder having two flat sides essentially perpendicular to a cylindrical side, the cylinder being connected by one flat side against the flat portion of the first part.

30. (Previously Presented) The irradiation cell according to claim 27, wherein one of the two parts has a ridge and the other has a groove corresponding to the ridge, in order to obtain perfect coaxial positioning of the two parts with respect to each other.

31. (Currently Amended) An irradiation cell for producing a radioisotope of interest through the irradiation of a target material by a particle beam, the irradiation cell comprising a target body, a removable metallic insert comprising a cavity designed to house the target material, the cavity closed by an irradiation window and the metallic insert configured to be inserted in and removed from the target body, wherein the removable metallic insert comprises at least two separate metallic parts of different materials, the metallic insert comprising at least a first part and a second part, the first part having an elongated cavity that is longer in a direction parallel to the particle beam that irradiates the target than in a direction perpendicular to the particle beam, and the second part partially surrounding the first part and forming a channel configured to guide a cooling medium in a direction parallel to the direction of the beam and perpendicular to the direction of the beam so that the cooling medium surrounds the cavity.

32. (Previously Presented) The irradiation cell according to claim 31, wherein said cell further comprises a coolant supply configured to supply the cooling medium ~~and~~ with the coolant supply in connection with the channel, a diffuser device

surrounding the first part, the diffuser device being configured to guide the cooling medium around the first part, and wherein the second part surrounds both the first part and the diffuser device in a manner to form a return path for the cooling medium between the diffuser device and the second part.

33. (Previously Presented) The irradiation cell according to claim 31, wherein the contact between the first and second part is a metal-to-metal contact, and wherein the parts are sealed by at least one O-ring.

34. (Previously Presented) The irradiation cell according to claim 31, wherein the first and second parts are sealed by a gold foil between the parts.

35. (Previously Presented) The irradiation cell according to claim 31, wherein the first and second parts are assembled together by a number of bolts.

36. (Previously Presented) The irradiation cell according to claim 31, wherein the first and second parts are assembled together by welding.

37. (Previously Presented) The irradiation cell according to claim 31, wherein the first part comprises a flat, circular and ring-shaped portion having an inner circular edge and an outer circular edge, a cylindrical portion rising perpendicularly from the inner circular edge of the flat portion, and a hemispherical portion being on top of the cylindrical portion, the cavity being formed inside the cylindrical and hemispherical portions.

38. (Previously Presented) The irradiation cell according to claim 31, wherein the first part is made of niobium or tantalum.

39. (Previously Presented) The irradiation cell according to claim 31 , wherein the second part is made of stainless steel.

40. (Previously Presented) The irradiation cell according to claim 31, wherein the cell further comprises a supply tube configured to supply a cooling medium and, in connection with the supply tube, a diffuser device mounted on one end of the supply tube, the diffuser device surrounding the first part, the diffuser element being configured to guide the cooling medium around the first part, and wherein the second part surrounds both the first part and the diffuser element in a manner to form a return path for the cooling medium between the diffuser element and the second part.

41. (Currently Amended) An irradiation cell for producing a radioisotope of interest through the irradiation of a target material by a particle beam, the irradiation cell comprising a target body, a removable metallic insert comprising a cavity designed to house the target material, the cavity closed by an irradiation window and the metallic insert configured to be inserted in and removed from the target body, wherein the removable metallic insert comprises at least two separate metallic parts of different materials, the metallic insert comprising at least a first part and a second part, the first part machined from ~~comprising~~ a material selected from the group consisting of niobium and tantalum and forming a cavity that is elongate in a direction parallel to the particle beam that irradiates the target, and the second part being a generally cylindrical hollow member comprising a material selected from the group consisting of stainless steel, silver, and titanium, the second part partially surrounding the first part and forming a channel configured to guide a cooling medium in a direction parallel to the direction of the beam and perpendicular to the direction of the beam so that the cooling medium surrounds the cavity,

wherein the cell further comprises a supply tube configured to supply a cooling medium and, in connection with the supply tube, a diffuser device mounted on one end of the supply tube, the diffuser device surrounding the first part, the diffuser element being configured to guide the cooling medium around the first part, and wherein the second part surrounds both the first part and the diffuser element in a manner to form a return path for the cooling medium between the diffuser element and the second part.